STATE OF ALASKA DOT&PF

STATEWIDE MATERIAL SITE INVENTORY

STATUS & INSPECTION REPORTS

NORTHERN REGION
VOLUME 3

FEDERAL AID HIGHWAY SYSTEM
SECONDARY ROUTE NO. S-711
REMINGTON – JACK WARREN ROAD AREA

FEDERAL PROJECT NO. STP-000S(530)
AKSAS PROJECT NO. 76174

ALASKA DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
5800 East Tudor Road
Anchorage, Alaska 99507-1286

April, 2008

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LIMITATIONS

The discussions of material site conditions presented in these reports has been based on the pertinent information listed herein and are intended to be used for planning purposes only. The information contained should be verified prior to use for design or construction purposes. To be sure of comprehensiveness, please check with State of Alaska DOT&PF materials staff for updated information. Every reasonable effort has been made to assure the accuracy of the maps and associated data. However, the State of Alaska DOT&PF makes no warranty, representation or guaranty as to the content, sequence, accuracy, timeliness or completeness of any of the data provided herein. The State of Alaska DOT&PF explicitly disclaims any representations and warranties, including, without limitation, the implied warranties of merchantability and fitness for a particular purpose. The State of Alaska shall assume no liability for any errors, omissions, or inaccuracies in the information provided regardless of how caused. The State of Alaska DOT&PF shall assume no liability for any decisions made or actions taken or not taken by the user of the applications in reliance upon any information or data furnished hereunder.

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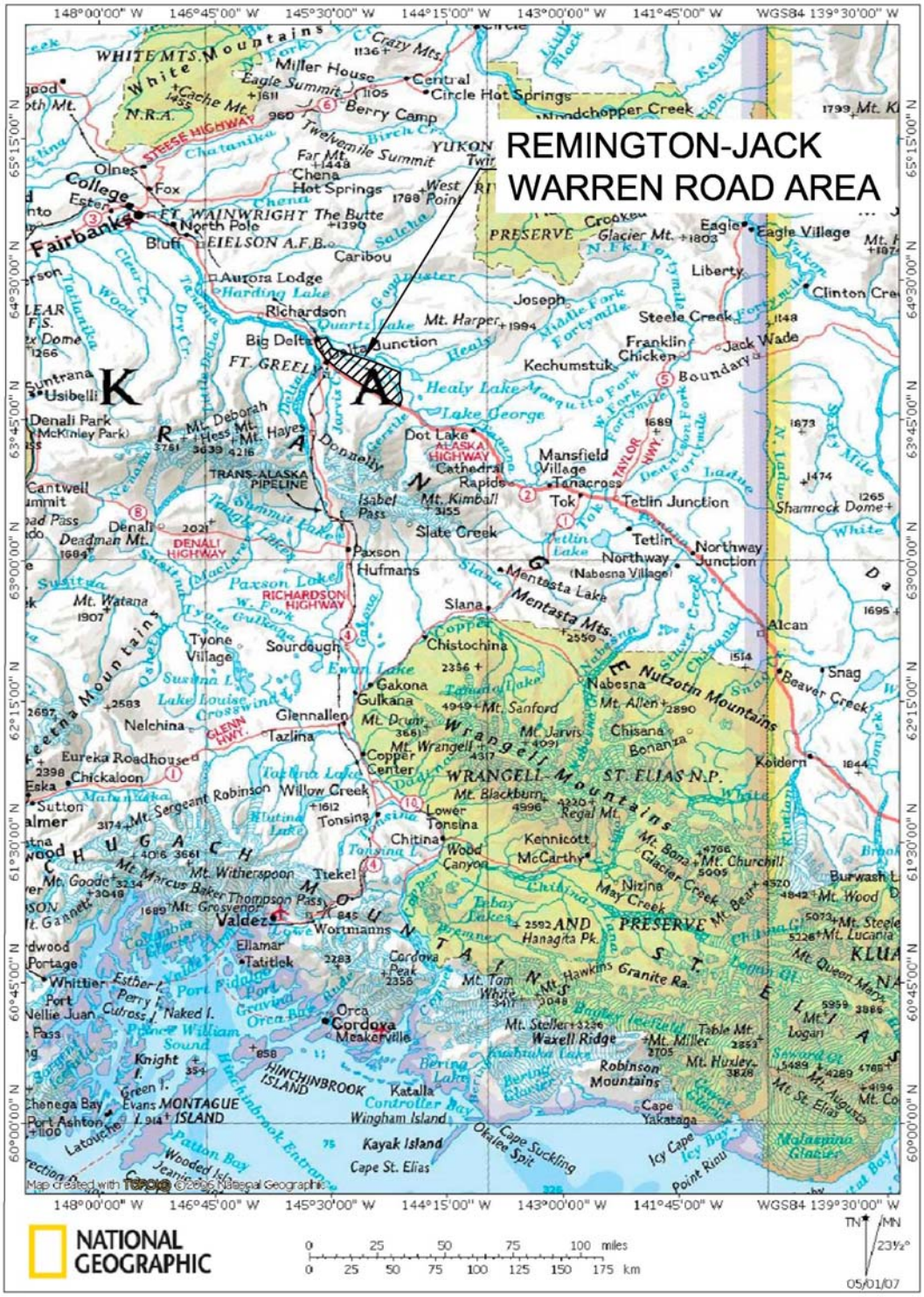
REMINGTON-JACK WARREN ROAD AREA

AREA MAP



1.0 MATERIAL SITE NUMBERING

Alaska Department of Transportation and Public Facilities (DOT&PF) material site numbers for secondary routes are generally assigned using the following format.

For secondary route system coding, i.e. 711-1-001-2:

- The first three numbers represent the secondary route number. The remainder of the numbering is the same as for the primary routes.
- The fourth digit represents the control section of the route.
- The 5^{th}, 6^{th}, and 7^{th} digits are the assigned site number.
- The last digit is the region in which the site is located.

Thus, 711-001-2 is site one in the Delta area which lies in the Northern Region.

2.0 GEOLOGIC SETTING

The following information is general in nature and is intended to provide those who are unfamiliar with the area with a general description of the geology and how it relates to the material sites. This information is not intended to be complete. More detailed investigations should be performed before decisions are made on individual material sites.

2.1 Location

The Remington – Jack Warren Road area is located along Federal Aid Highway System Secondary Route No. S-711. The area lies both to the northeast and east of the City of Delta Junction. The area is also known as the Delta Barley Project and many of the roads were constructed in support of farming activities. The area stretches from the east side of the Gerstle River to the Delta River on the west, and from the Alaska Highway on the south to the Tanana River on the north. The area covers approximately 175,000 acres (275 square miles) and is crisscrossed by secondary roads, both paved and gravel surfaced.

There are several material sites in the floodplain of the Delta River, along the Alaska and Richardson Highways and in the Gerstle River floodplain, that while they lie in or near the Remington –Jack Warren Road area, are not included in this report. These sites are identified by “62” numbers and are Alaska Highway sites. It should be noted that the Alaska Highway “62” numbers are also used along the Richardson Highway between Delta Junction and Fairbanks.

The Remington – Jack Warren Road area can be divided into two regions, the large Delta Outwash Fan and the western Delta River floodplain and glacial moraines along the Richardson Highway.

2.2 General Geology

The Remington – Jack Warren Road area is located in the upper Tanana Valley, between the relatively young and more rugged Alaska Range and the older more subdued hills to the north of the Yukon Tanana Uplands. Unconsolidated sources of material along this portion of the Alaska Highway consist of glacial, fluvial, and eolian deposits. The glacial deposits occur south of the Tanana River and consist of glacial till and outwash deposited during several glacial episodes. Large alluvial fans are found along the south side of the Tanana Valley and include the large outwash fan between Delta Junction and the Gerstle River. Relatively small river terraces are also present along the Tanana River.

The Gerstle River flowing through the east end of the area is glacially fed and subject to high flow during both warm summer weather and periods of high rainfall. The river is a losing system (i.e. the groundwater table is lower than the river level whereby water flows from the river to the groundwater table). Thus, the floodplain decreases in size toward the Tanana River. Both the Delta River and the upper portion of the Gerstle River have braided aggrading floodplains. These rivers carry large bed loads; therefore material sites in their floodplains are filled in or "replenished" over time. The Tanana River is a large meandering river flowing along the north edge of the Delta Outwash Fan.

Generally, permafrost in the area is either discontinuous or occurs in isolated masses. Where permafrost occurs in fine-grained or organic soils, it may be ice-rich.

2.3 Delta Outwash Fan

Between MP 1393.2 and MP 1413.5, the Alaska Highway crosses an outwash fan that slopes gently to the north with little relief until it reaches the Tanana River. The northern portion of this fan includes the Remington – Jack Warren Road area. Materials consist of sand and coarse gravel, overlain by a varying thickness of eolian silt. Excellent material sites can be located almost anywhere on this fan. Minimizing overburden depth and permafrost are the usual criteria for these site locations.

There are numerous small creeks that flow across this fan. Many of them are ephemeral, flowing only at certain times of day or year. Pits along Cummings Road are subject to flooding by overflow from the Gerstle River. The central part of this area, along Spruce and Sawmill Roads is in the upper part of the Clearwater Creek drainage. Clearwater Creek and some of its tributaries originate north of the Alaska Highway and may be connected to groundwater flow from the Gerstle River. Numerous ephemeral streams originate south of the Alaska Highway and flow north to Clearwater Creek, including Sawmill Creek, Rhoads Creek and Granite Creek.

Groundwater depths vary widely across the fan, ranging from greater than 50 feet to less than 10 feet below the surface. Generally, observations indicate that the groundwater table shallows northward toward the Tanana River and eastward toward the Gerstle River. Varying permeability of material in the fan may cause groundwater to flow through buried channels, creating conditions with variable groundwater tables within short distances. Significant changes to the ground-

water table may occur during the year and groundwater measurements stretching over one or more years should be conducted in new sites or prior to deepening existing sites.

Along the western side of the fan, shallow groundwater was observed in pits nearer to the Tanana River (i.e. MS 711-009-2). Closer to the Alaska Highway, groundwater depths appeared to be greater than 45 feet (i.e. MS 711-002-2). Along the eastern portion of the fan, groundwater tables appear to be influenced by flow from the Gerstle River and may rise and fall in relationship to river levels. The groundwater table in the central portion of the area is not well documented. Shallow groundwater was noted in MS 711-012-2 along a tributary of Sawmill Creek. The tributary appeared to originate near the Gerstle River channel.

Permafrost ranges from sporadic to discontinuous and the soil ice descriptions from well bonded to very friable, depending on moisture content and ground temperature.

Degradation values in the alluvial and glaciofluvial gravel were generally greater then 50 and the Los Angeles Abrasion loss less than 30 percent. These test results indicate that material for producing crushed aggregates is potentially widely available in this area.

2.4 Glacial Moraine and the Delta River Floodplain

The western portion of the Remington – Jack Warren Road area is underlain by glacial moraines and both abandoned and active floodplains of the Delta River. The area also includes a portion of the large alluvial fan of Jarvis Creek. Outside of a few abandoned channels on the Jarvis Creek Fan, the fluvial material is covered with deep (>10 feet) deposits of fluvial and eolian silt. The glacial moraine forms a high ridge parallel and to the east of the Richardson Highway and is covered with numerous kettle lakes.

The only current DOT&PF sites in this portion of the area are Alaska/Richardson Highway sites that lie on the active floodplain of the Delta River. There are several old pits associated with abandoned channels of Jarvis Creek.

3.0 LAND USE PLANNING – TANANA BASIN AREA PLAN

State lands along the Alaska Highway are being managed by the State of Alaska Department of Natural Resources (DNR) under the Tanana Basin Area Plan adopted in 1991 (Subregions 6 and 7). The complete plan is available on the internet at the following address:

http://www.dnr.state.ak.us/mlw/planning/areaplans/tanana/index.cfm

The introduction to the plan states that "The plan designates the uses that will occur on state lands within the Tanana Basin. It shows areas to be sold for private use and area to be retained in state ownership. It does not direct land uses for private, borough, or federal land, nor does it direct land uses for areas already legislatively designated for specific purposes, such as parks or wildlife refuges."

The section on Materials in Chapter 2: Goals of the plan, list one of the goals of the plan as "Maintain in state ownership and make available to public and private users sufficient, suitably located material sites to economically meet the area's long term need for materials."

The following are the Management Guidelines:

> "**A. Preferred Material Sites.** When responding to a request for a material sale or identifying a source for material, the highest priority should be to use existing material sources. Using materials from wetlands and lakes should be avoided unless no feasible alternative exists. Sales or permits for sand, silt, or gravel extraction will not be permitted in fish spawning area identified by DF&G unless extraction would enhance the site for rearing and DF&G determines that the activity is compatible with fish habitat values.
>
> **B. Material Sites.** To minimize the construction and maintenance cost of transportation facilities, material sites should be located as near as is feasible to the site where the material will be used.
>
> Design of projects will be on a case by case basis in consultation with other agencies. The following are general guidelines for extracting materials:
>
> > **1. Material Sources.** Consideration should be given to all potential material sources. Location and design of sites should take into account factors such as scenic quality, transportation to the site, and effects to fish and wildlife habitat.
> >
> > **2. River Size and Recharge Rates.** Selection of gravel sites in floodplains should take into account the volume of gravel available from various stream types. Generally, the largest river feasible, or the one with the largest gravel recharge rates should be chose.

3. Reclamation. Reclamation of material sites will be accomplished consistent with AS 17.15.

4. Extraction from Active Channels. When extracting gravel in active or inactive floodplains, maintain buffers that will minimize sedimentation and will contain active channels in their original locations and configurations in the short term.

C. Maintaining Other Uses and Resources when Siting and Operating Material Sites. Before allowing the extraction of materials, the manager will ensure that the requirements of the permit or lease give adequate protection to other important resources and uses including existing water rights, water resource quantity and quality, navigation, fish and wildlife habitat and harvest, commercial forest resources, recreation resources and opportunities, historic and archaeological resources, adjacent land uses, and access to public or private lands. Disposal of materials should be consistent with the applicable management intent statement and management guidelines of the plan.

The manager should also determine if other existing material sites can be vacated and rehabilitated as a result of opening a new material site.

D. Screening and Rehabilitation. Material sites should be screened from roads, residential areas, recreational areas, and other areas of significant human use. Sufficient land should be allocated to the material site to allow for such screening. Where appropriate, rehabilitation of material sites will be required. For additional guidelines affecting material extraction see policies under the subsurface resources section.

E. Other Guidelines Affecting Materials. Other guidelines may affect materials. See in particular the following sections of this chapter:

- Fish and Wildlife Habitat and Harvest
- Settlement
- Subsurface Resources
- Transportation”

4.0 RELEVANT PUBLICATIONS

The following is a list of publications that may be useful for understanding the geology and material sources of the Remington – Jack Warren Road area.

Carter, L.D., and Galloway, J.P., 1978, Preliminary engineering geologic maps of the proposed natural gas pipeline route in the Tanana River valley, Alaska, U.S. Geological Survey Open-File Report 78-794, 26 p., 3 sheets, scale 1:125,000.

Cobb, E.H., 1977, comp., Generalized geologic map of the eastern part of southern Alaska, U.S. Geological Survey Open-File Report 77-169-B, 1 sheet, scale 1:1,000,000.

Coulter, H.W., et al., 1965, Map showing extent of glaciations in Alaska, U.S. Geological Survey Miscellaneous Geologic Investigations Map I-415.

Eberlein, G.D., Gassaway, J.S., and Beikman, H.M., 1977, Preliminary geologic map of central Alaska, U.S. Geological Survey Open-File Report 77-168-A, 1 sheet, scale 1:1,000,000.

Foster, H.L., Keith, T.E.C., and Menzie, W.D., 1987, Geology of east-central Alaska, U.S. Geological Survey Open-File Report 87-188.

Foster, H.L., comp., 1992, Geologic map of the eastern Yukon-Tanana region, Alaska, U.S. Geological Survey Open-File Report 92-313, 26 p., 1 sheet, scale 1:500,000.

Holmes, G.W., 1965, Geologic reconnaissance along the Alaska Highway, Delta River to Tok Junction, Alaska, U.S. Geological Survey Bulletin 1181-H, p. H1-H19, 1 sheet, scale 1:125,000.

Holmes, G.W., and Foster, H.L., 1968, Geology of the Johnson River area, Alaska, U.S. Geological Survey Bulletin 1249, 49 p., 1 sheet, scale 1:63,360.

Holmes, G.W., and Pewe, 1965, T.L., Geologic map of the Mount Hayes D-3 Quadrangle, Alaska, U.S. Geological Survey Geologic Quadrangle Maps 366, 1 sheet, scale 1:63,360.

Moffit, F.H., 1954, Geology of the eastern part of the Alaska Range and adjacent area, U.S. Geological Survey Bulletin 989-D, p. 63-218, 2 sheets, scale 1:250,000.

Nokleberg, W.J., Aleinikoff, J.N., Lange, I.M., Silva, S.R., Miyaoka, R.T., Schwab, C.E., and Zehner, R.E., 1992, Preliminary geologic map of the Mount Hayes Quadrangle, eastern Alaska Range, Alaska, U.S. Geological Survey Open-File Report 92-594, 39 p., 1 sheet, scale 1:250,000.

Reger, R. D., 1987, Survey of the Sand-and-Gravel Potential of Legislatively Designated Replacement Pool Lands in Alaska, Alaska Division of Geological & Geophysical Surveys Public Data File 88-2, 18 p, 227 sheets, scale 1:63,360.

Reger, R.D., and Pewe, T.L., 2003, Geologic map of the Big Delta A-4 Quadrangle, Alaska, Alaska Division of Geological & Geophysical Surveys Report of Investigation 2002-2, 1 sheet, scale 1:63,360.

State of Alaska Department of Transportation and Public Facilities, 1977, Route Reconnaissance, Alaska Highway, Delta Junction to Tok Junction, Project Numbers F-062-3 (12) and F-062-3 (18): 21 p., 36 sheet, scale 1:12,000.

Weber, F.R., Foster, H.L., Keith, T.E.C., and Dusel-Bacon, Cynthia, 1978, Preliminary geologic map of the Big Delta Quadrangle, Alaska, U.S. Geological Survey Open-File Report 78-529-A, 1 sheet, scale 1:250,000.